

LISTING OF CLAIMS

1. (currently amended) A system for endoscopic suturing using an endoscope having a flexible shaft with a distal end comprising:

a flexible tube having first and second ends, said flexible tube being attachable at one or more locations along the outside of said shaft of said endoscope to enable said tube to flex with flexing of said shaft of said endoscope; and

a tip attachable to said distal end of said shaft of said endoscope having an opening through which said second end of said flexible tube is received, wherein said flexible tube operates as a conduit for passage of one or more instruments, wherein at least two of said instruments represents a suturing instrument and a suture securing instrument which are separately insertable through said flexible tube.

2. (currently amended) A The system for endoscopy using an endoscope having a flexible shaft with a distal end according to Claim 1 further comprising:

a flexible tube having first and second ends, said flexible tube being attachable at one or more locations along the outside of said shaft of said endoscope to enable said tube to flex with flexing of said shaft of said endoscope;

a tip attachable to said distal end of said shaft of said endoscope having an opening through which said second end of said flexible tube is received, wherein said flexible tube operates as a conduit for passage of one or more instruments; and

a plurality of tube guides, each of said plurality of tube guides being attachable at a different one of said locations along the outside of said shaft of said endoscope and has an opening through which said flexible tube extends, and said flexible tube is slidable through said opening of the tube guide in response to flexing of said shaft of said endoscope.

3. (previously presented) The system according to Claim 1 further comprising:

a cannula attached to said first end of said flexible tube in which each of said instruments passes through said cannula into said flexible tube.

4. (currently amended) The system according to Claim 1 wherein at least one of said instruments represents a suturing instrument having has a shaft sufficiently flexible to enable passage through said tube.

5. (currently amended) The system according to Claim 4-1 wherein said tissue suturing instrument further comprises means for engaging tissue having a sew tip with a gap, said sew tip being coupled to said shaft of said tissue suturing instrument, and a sleeve over said sew tip having one end capped and an opening to at least said gap, and said system further comprising means for providing suction is a channel along said shaft to said gap of said sew tip to enable tissue to be pulled into said gap.

6. (original) The system according to Claim 5 wherein said tissue suturing instrument has at least one needle in said sew tip, and means for driving said needle forward through said suctioned tissue into a ferrule having one end of suture, and retracting said needle through said suction tissue with said ferrule.

7. (currently amended) The system according to Claim 4-1 wherein said suturing instrument further comprises a tissue engaging end coupled to said shaft of said suturing instrument, and said shaft of said suturing instrument has a channel for applying suction to said tissue engaging end of said tissue suturing instrument, and means for connecting to said channel through said shaft of said suturing instrument for applying vacuum establishing said suction.

8. (currently amended) A The system according to Claim 4 for endoscopic suturing using an endoscope having a flexible shaft with a distal end comprising:

a flexible tube having first and second ends, said flexible tube being attachable at one or more locations along the outside of said shaft of said endoscope to enable said tube to flex with flexing of said shaft of said endoscope; and

a tip attachable to said distal end of said shaft of said endoscope having an opening through which said second end of said flexible tube is received, wherein said flexible tube operates as a conduit for passage of one or more instruments, wherein at least one of said instruments represents a suturing instrument having a shaft sufficiently flexible to enable passage through said tube, and said suturing instrument further comprises a tissue engaging end coupled to said shaft of said suturing instrument and a housing coupled to said shaft of said instrument, in which said shaft of said suturing instrument has a first section and a second section, and said first section is rigid and extends from said housing, and said second section is flexible and extends from the first section to the tissue engaging end of said suturing instrument.

9. (previously presented) The system according to Claim 8 wherein said first section of said shaft of said suturing instrument has a rigid tube and a first guide member in said tube having a plurality of tracks for at least one needle and suture, and said second section of said shaft has a second guide member having a plurality of tracks for at least one needle and suture, and said shaft has a coupler member for coupling said first and second guide members to each other.

10. (previously presented) The system according to Claim 9 wherein a wire is attached to said coupler member through said second guide member and attached into said tissue engaging end.

11. (previously presented) The system according to Claim 8 wherein said suturing instrument further comprises means for translating rotation of one of said housing and said first section to said second section of said shaft and said tissue engaging end of said suturing instrument.

12. (previously presented) The system according to Claim 8 wherein said suturing instrument further comprises at least one needle which extends through said shaft of the suturing instrument to said tissue engaging end.

13. (previously presented) The system according to Claim 8 wherein said suturing instrument further comprises one or more needles which extends through said shaft of the suturing instrument to said tissue engaging end, in which each of said needles comprises first and second members and a spring which couples said first and second members, and said second member has a tip positionable in said tissue engaging end.

14. (previously presented) The system according to Claim 13 wherein said second section of said shaft of said suturing instrument has a tube having holes extending through said tube of said second section for at least said needles.

15. (previously presented) The system according to Claim 13 wherein said second section of said shaft of said suturing instrument has a flexible tube for each of said needles, and

each of said needles passes through said flexible tube of said second section to said tissue engaging end.

16. (previously presented) The system according to Claim 15 wherein said flexible tube of said second section of said shaft of said suturing instrument comprises a spring having two ends and having an outer sheath attached to said two ends to restrict elongation of the spring while enabling flexure of the flexible tube of said second section.

17. (previously presented) The system according to Claim 13 wherein said needles extend through said shaft of the suturing instrument and said spring of each of said needles is located in said second section to assist in flexibility of said needles.

18. (previously presented) The system according to Claim 13 wherein each of said needles further comprises a cable or wire which couples said spring between said first and second members.

19. (previously presented) The system according to Claim 1 wherein said system further comprises an endoscope representing a gastroscope.

20. (previously presented) The system according to Claim 1 wherein said instruments are capable of operating independently of said endoscope.

21. (cancelled)

22. (currently amended) The system according to Claim 24 1 wherein said suture securing instrument comprises a shaft which is at least partially flexible to enable passage through said tube.

23. (currently amended) The system according to Claim 24 1 wherein said suture securing instrument further comprises means for retaining in a sleeve member the two free ends of a loop of suture extending through tissue, and means for cutting the two free ends of the loop of suture near said sleeve member.

24. (currently amended) The system according to Claim 24 1 wherein said suture securing instrument is not part of an endoscope.

25. (previously presented) The system according to Claim 1 wherein said shaft at least one of said instruments has a shaft having a distal end, and said system further comprises an endoscope having means for viewing the distal end of said one of said instruments when said distal tissue engaging end is located through said first and second ends of said tube.

26. (previously presented) The system according to Claim 4 wherein said shaft of said suturing instrument has a distal tissue engaging end, and a channel for applying positive or negative air pressure to said end of said tissue suturing instrument, and means for connecting to said channel through said shaft for applying said positive or negative air pressure.

27. (currently amended) A The system according to Claim 4 for endoscopic suturing using an endoscope having a flexible shaft with a distal end comprising:

a flexible tube having first and second ends, said flexible tube being attachable at one or more locations along the outside of said shaft of said endoscope to enable said tube to flex with flexing of said shaft of said endoscope; and

a tip attachable to said distal end of said shaft of said endoscope having an opening through which said second end of said flexible tube is received, wherein said flexible tube operates as a conduit for passage of one or more instruments, wherein said suturing instrument further comprises a distal tissue engaging end coupled to said shaft of said suturing instrument, in which said shaft of said suturing instrument has a channel to said tissue engaging end and an opening to said channel, and said flexible tube has a port capable of enabling suction to be provided to said tissue engaging end through said opening and channel of said shaft, in which said opening of said tip has a seal for engaging with said tissue engaging end of said suturing instrument to enable said suction to be provided through said opening of said shaft.

28. (previously presented) The system according to Claim 1 further comprising an endoscope having a shaft attached to said flexible tube and said tip.

29. (previously presented) The system according to Claim 1 further comprising means for locking the position of at least one of said instruments with respect to said flexible tube at the tip of said flexible tube.

30. (previously presented) The system according to Claim 1 wherein at least one of said instruments represents has a shaft sufficiently flexible to enable passage through said tube, and said shaft of said one of said instruments has a distal end having a substantially cylindrical outer surface with one or more protrusion members along said outer surface of said distal end, and said opening of said tip having one or more slots into which said protrusion members are receivable to lock the position of said one of said instruments with respect to said flexible tube at said tip.

31. (previously presented) The system according to Claim 4 wherein said suturing instrument further comprises a tissue engaging end coupled to the shaft of said suturing instrument, and means for steering said tissue engaging end.

32. (original) The system according to Claim 31 wherein said steering means is one of hydraulically and mechanically actuated.

33-43. (cancelled)

44. (previously presented) A system for endoscopic suturing in the body of a patient comprising:

an endoscope having a shaft and an internal channel along said shaft locatable in the body of a patient;

a suturing instrument having at least a partially flexible shaft which is locatable through said internal channel of said endoscope to locate at least one loop of suture in the body of a patient; and

a suture securing instrument having at least a partially flexible shaft which is locatable through said internal channel of said endoscope to retain in a sleeve member the loop of suture and then cut the suture extending from said sleeve member to secure said suture in the body of the patient.

45. (previously presented) The system according to Claim 1 wherein said flexible tube is attachable to and detachable from different types of endoscopes.

46. (previously presented) The system according to Claim 1 wherein said system further comprises an endoscope having a shaft with a channel for passage of tools and said flexible tube is of a diameter larger than said channel.

47. (previously presented) The system according to Claim 1 wherein each of said instruments is sufficiently flexible to be locatable through said first and second ends of said tube when having one or more flexures in accordance with flexing of said shaft of said endoscope.

48. (currently amended) The system according to Claim 1 22 wherein said an endoscope has an internal channel along said shaft, and at least one of said suturing instrument and said suture securing instrument is locatable through said internal channel of said endoscope.

49-72. (cancelled)

73. (previously presented) A system of endoscopic suturing comprising:
means for attaching an external tube along a flexible shaft of an endoscope to flex with flexing of said shaft;

a suturing instrument locatable through said external tube attached to said endoscope to locate at least one loop of suture through tissue in a body of a patient; and

a suture securing instrument having at least a partially flexible shaft which is locatable through said external tube attached to said endoscope to retain in a sleeve member the loop of suture and then cut the suture extending from said sleeve member to secure said suture in the tissue.

74. (currently amended) A system of endoscopic suturing comprising:
an endoscope locatable in the body of a patient having a flexible shaft with a steerable distal end;
a flexible guide tube having first and second ends locatable outside said shaft, and have the first end attached to the distal end of said shaft to be steered with steering of said distal end of said endoscope; and

at least one tissue suturing instrument and one suture securing instrument, each having a shaft which is sufficiently flexible to be insertable through the flexible guide tube when the flexible guide tube is located in a body of a patient.

75. (new) The system according to Claim 74 further comprising a plurality of tube guides attached at a different locations along said shaft of said endoscope, each of said tube guides having an opening through which said flexible tube extends, and said flexible tube is slidable through said opening of the tube guide in response to flexing of said shaft of said endoscope to maintain said guide tube substantially coaxial with said shaft of said endoscope.

76. (new) The system according to Claim 2 wherein said tube guides are attachable to the shaft of said endoscope at the same circumferential position along the outside of the shaft of said endoscope.

77. (new) The system according to Claim 2 wherein at least one of said instruments represents a suturing instrument or a suture securing instrument insertable through said flexible tube.

78. (new) The system according to Claim 2 wherein at least one of said instruments represents has a shaft sufficiently flexible to enable passage through said tube, and said shaft of said one of said instruments has a distal end having a substantially cylindrical outer surface with one or more protrusion members along said outer surface of said distal end, and said opening of said tip having one or more slots into which said protrusion members are receivable to lock the position of said one of said instruments with respect to said flexible tube at said tip.

79. (new) The system according to Claim 78 wherein said shaft of said suturing instrument has a distal tissue engaging end, and a channel for applying positive or negative air pressure to said end of said tissue suturing instrument, and means for connecting to said channel through said shaft for applying said positive or negative air pressure.

80. (new) The system according to Claim 78 wherein said suturing instrument further comprises a distal tissue engaging end coupled to said shaft of said suturing instrument, in which said shaft of said suturing instrument has a channel to said tissue engaging end and an opening to

said channel, and said flexible tube has a port capable of enabling suction to be provided to said tissue engaging end through said opening and channel of said shaft, in which said opening of said tip has a seal for engaging with said tissue engaging end of said suturing instrument to enable said suction to be provided through said opening of said shaft.

81. (new) The system according to Claim 78 wherein said suturing instrument further comprises a tissue engaging end coupled to the shaft of said suturing instrument, and means for steering said tissue engaging end.

82. (new) A system for endoscopic suturing using an endoscope having a flexible shaft with a distal end comprising:

a flexible tube having first and second ends, said flexible tube being attachable at one or more locations along the outside of said shaft of said endoscope to enable said tube to flex with flexing of said shaft of said endoscope; and

a tip attachable to said distal end of said shaft of said endoscope having an opening through which said second end of said flexible tube is received, wherein said flexible tube operates as a conduit for passage of one or more instruments, wherein at least one of said instruments represents a suturing instrument having a shaft sufficiently flexible to enable passage through said tube, and said suturing instrument further comprises a tissue engaging end coupled to said shaft of said suturing instrument and a housing coupled to said shaft of said instrument, in which said shaft of said suturing instrument has a first section and a second section, and said first section is rigid, and said second section is flexible and extends from the first section to the tissue engaging end of said suturing instrument.

83. (new) A system for endoscopy using an endoscope having a flexible shaft with a distal end comprising:

a flexible tube;

a member for distally attaching the shaft of said endoscope and said flexible tube in which said flexible tube provides a conduit for passage of one or more instruments along side said shaft of said endoscope; and

one or more tube guides attachable along substantial length of said shaft of said endoscope, each of said tube guides having an opening through which said flexible tube extends, and said flexible tube slides through said openings of said tube guides when said shaft of said

endoscope is flexed in multiple dimensions to maintain said flexible tube in a substantially coaxial orientation with the shaft of said endoscope.

84. (new) The system according to Claim 83 wherein said tube guides are attached at the same circumferential location along said shaft of said endoscope.

85. (new) The system according to Claim 83 wherein at least one of said instruments represents has a shaft sufficiently flexible to enable passage through said tube, and said shaft of said one of said instruments has a distal end having a substantially cylindrical outer surface with one or more protrusion members along said outer surface of said distal end, and said opening of said tip having one or more slots into which said protrusion members are receivable to lock the position of said one of said instruments with respect to said flexible tube at said tip.

86. (new) The system according to Claim 83 wherein at least one of said instruments represents a suturing instrument or a suture securing instrument insertable through said flexible tube.

87. (new) The system according to Claim 86 wherein said shaft of said suturing instrument has a distal tissue engaging end, and a channel for applying positive or negative air pressure to said end of said tissue suturing instrument, and means for connecting to said channel through said shaft for applying said positive or negative air pressure.

88. (new) The system according to Claim 86 wherein said suturing instrument further comprises a distal tissue engaging end coupled to said shaft of said suturing instrument, in which said shaft of said suturing instrument has a channel to said tissue engaging end and an opening to said channel, and said flexible tube has a port capable of enabling suction to be provided to said tissue engaging end through said opening and channel of said shaft, in which said opening of said tip has a seal for engaging with said tissue engaging end of said suturing instrument to enable said suction to be provided through said opening of said shaft.

89. (new) The system according to Claim 86 wherein said suturing instrument further comprises a tissue engaging end coupled to the shaft of said suturing instrument, and means for steering said tissue engaging end.